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Supreme Court of the United States

OCTOBER TERM, 1992

WILLIAM DAUBERT AND JOYCE DAUBERT, INDIVIDUALLY AND AS GUARDIANS AD LITEM FOR JASON DAUBERT, AND ANITA DE YOUNG, INDIVIDUALLY AND AS GUARDIAN AD LITEM FOR ERIC SCHULLER,
Petitioners,

v.

MERRELL DOW PHARMACEUTICALS, INC.,
Respondent.

On Appeal from the United States Court of Appeals for the Ninth Circuit

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BRIEF FOR A GROUP OF AMERICAN LAW PROFESSORS AS *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY

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It should be noted that several of our colleagues felt precluded from adding their names because they had agreed to act as consultants to one of the parties to the instant case.

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BRIEF FOR A GROUP OF AMERICAN LAW PROFESSORS AS *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY

INTEREST OF AMICI [1]

This brief is submitted on behalf of a group of law professors with strong scholarly, teaching and professional interests in the Court's interpretation of the Federal Rules of Evidence. This Brief is offered in the tradition of *amicus curiae*, with a view solely to supplying whatever assistance we can to the Court.

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[1] Appellants and appellees have consented to the filing of this Brief and their letters of consent are being filed separately herewith.

The lower federal courts have crafted sundry ways to evaluate the admissibility of scientific information. As we map this tortured landscape, we hope to offer the Court some guidance through the thicket.

SUMMARY OF DISCUSSION[2]

Lower courts are divided on the issue of whether the Rules incorporate the common law "general acceptance" test articulated in *Frye v. United States*. In several recent cases, this Court adhered strictly to a plain-meaning approach to interpreting the Rules. An application of this approach to Rule 702 means that the *Frye* test is not incorporated in the Rules.

The proper standard under Article VII demands more than the relevancy requirement already mandated under Rule 401. Although sometimes described loosely as a "relevancy test," the standard for scientific testimony actually set out in Article VII is the helpfulness criterion stated in Rule 702: Expert testimony on "scientific" or "technical" matters must "assist the trier of fact." While helpfulness is related both to relevancy and qualifications, helpfulness is not just another word for these terms.

Courts applying Rule 702 have offered various interpretations of Article VII's helpfulness requirement. One view revisits the general acceptance test and maintains that the language of the Rules can be construed to require the test. Severe criticism of the *Frye* standard from courts and commentators should serve to caution the Court against reliance on this interpretation. The general acceptance test suffers from several fundamental weaknesses which render it susceptible to manipulation.

[2] We selected a discussion format rather than an argument format because the primary purpose of this Brief is to offer guidance on the alternatives available to the Court. We do not specifically advocate any single remedy to the questions discussed. We do, however, draw certain lessons and conclusions that we believe follow from the discussion.

Although courts have been reluctant to recognize the relationship between scientific validity and Article VII's "relevancy test," the connection is undeniable. In fact, courts regularly evaluate the validity (or what is commonly, but erroneously, called "reliability") of scientific evidence under Rule 702. If scientific information is not valid, it does not increase or decrease the likelihood of any fact in issue; invalid science does not assist the trier of fact. The special methods used by scientists, however, complicate this determination. The central question posed by this case concerns what standard judges should employ when assessing the special methods of science.

The distinct nature of scientific information provides a significant reason to apply a *de novo* standard of review. A substantial part of the inquiry is legal in character, and the factual component differs from ordinary adjudicative fact judgments in which the appellate court defers to the trial court.

If this Court determines that the validity assessment should be treated as a preliminary fact question within the trial judge's discretion, it must then decide the nature of that inquiry. The Rules provide two possibilities. Under Rule 104(a), the judge must find "preliminary facts" by a preponderance of evidence. Alternatively, under 104(b), the judge's threshold examination is limited to finding that a reasonable trier of fact could find the fact to be true. The determinative issue is whether to characterize Rule 702 as an "exclusionary rule" to which 104(a) applies or as an "inclusionary rule" to which 104(b) applies.

The statutory history of Article VII is ambiguous regarding its inclusive or exclusive character. The structure and principles underlying the Rules, however, generally support the characterization of Rule 702 as an

"exclusionary rule." Rule 104(a) ordinarily applies to circumstances presented in rules such as Rule 702, where jurors cannot be expected to make both the preliminary and ultimate findings of fact. Rule 104(a) provides the strongest judicial check and best safeguards the jurors from invalid evidence.

Requiring judges to evaluate scientific validity has raised concerns over the ability of judges to comprehend science minutiae. This concern misstates the issue. Reality dictates that someone in the adjudication process must evaluate the validity of scientific information. Judges need not become experts themselves in various scientific disciplines. Fortunately, courts and commentators have proposed numerous factors that provide substantial guidance and assistance to the courts in assessing scientific accuracy.

Subsequent to the preliminary finding of validity, Rule 403 provides a final check on the admissibility of scientific evidence. It does not impose an independent standard of validity. Rather, it excludes scientific information that, though valid, would cause inordinate prejudice or waste of time.

The final issue that must be considered by this Court is whether the *writ of certiorari* was improvidently granted in light of the substantial legislative attention now focused on the matter. The immediate need for uniformity in the Rules coupled with the significant time necessary for legislative study and action on the issue strongly suggest that this Court decide the matter.

DISCUSSION

I. DOES ARTICLE VII OF THE FEDERAL RULES OF EVIDENCE INCORPORATE THE "GENERAL ACCEPTANCE" TEST ANNOUNCED IN *FRYE v. UNITED STATES* AS THE THRESHOLD ADMISSIBILITY STANDARD FOR THE FEDERAL COURTS? [3]

Rule 702 of the Federal Rules governs the admissibility of scientific evidence in federal courts. The Rule provides for the admissibility of expert opinion when "scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue . . . ." *Fed. R. Evid.* 702. Prior to the enactment of the Rules, the courts sometimes relied on the "general acceptance" test declared in *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923). This test requires that, in order to be admissible, novel [4] scien-

[3] Although the first Question Presented to this Court queries whether the Federal Rules incorporate the standard established in *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923), the question is silent as to which rule purportedly contains it. The district court below applied *Frye* in conjunction with Rule 703 and the circuit court did not specifically locate *Frye* in Article VII. *See Daubert*, 727 F. Supp. 570, 572 (S.D. Cal. 1989); 951 F.2d 1128, 1130 n.1 (9th Cir. 1991). Courts and commentators alike tend to be imprecise in placing the *Frye* standard, but the generally prevailing view appears to situate it in Rule 702. 3 Jack Weinstein & Margaret Berger, *Weinstein's Evidence* ¶ 702[03] at 702-36 (1989); Edward J. Imwinkelried, *The "Bases" of Expert Testimony: The Syllogistic Structure of Scientific Testimony*, 67 N.C. L. Rev. 1, 1-2 (1988); *see also* Paul C. Gianelli & Edward J. Imwinkelried, *Scientific Evidence* § 1-5(F), at 29-30 (1986). *But see* Mark McCormick, *Scientific Evidence: Defining a New Approach to Admissibility*, 67 Iowa L. Rev. 879, 888 (1982) ("[R]ule 703 also may have some bearing on the issue."). As a common law standard, placing *Frye* in Article VII is not essential; as a matter of statutory interpretation, of course, it is imperative that *Frye* be pinpointed.

[4] Although the *Frye* standard applies to *novel* scientific evidence, we do not distinguish between "novel science" and "established science." Article VII also does not make this distinction.

tific evidence "must be sufficiently established to have gained general acceptance in the particular field in which it belongs." *Id.* at 1014. With the Congress' enactment of the Federal Rules, the courts have divided over whether the Rules incorporate the *Frye* test. Paul C. Gianelli & Edward J. Imwinkelried, *Scientific Evidence* § 1-5(F), at 28-29 (1986).

The Rules and their history are silent on this question. Despite the dominance of the *Frye* test at the time the Rules were considered and adopted, the Advisory Committee's Notes, the congressional committee reports and the hearings on the Federal Rules do not address the issue. *Id.* at 29. Judge Weinstein has stated that the "silence of the rule[s] and its drafters may arguably be regarded as tantamount to an abandonment of the general acceptance standard." 3 Jack Weinstein & Margaret Berger, *Weinstein's Evidence* ¶ 702[03] at 702-36 (1989). He further argues that the "[e]limination of the *Frye* test is consistent with the underlying policies of Article VII." *Id.; see also* 22 Charles Allen Wright & Kenneth W. Graham, *Federal Practice and Procedure* § 5169, at 92 (1978) (concluding that *Frye* was repealed by the Federal Rules).

Some commentators disagree with Judge Weinstein's view. *See e.g.*, 1 David Louisell & Christopher Mueller, *Federal Evidence* § 105, at 818 (1977); Michael H. Graham, *Handbook of Federal Evidence* § 703.2 (3d ed. 1991). While Professors Louisell, Mueller and Graham criticize the *Frye* standard, they conclude that it survived enactment of the Rules. It was the only standard in common use and the Rules invite (if not require) some standard. Furthermore, it is argued that imposition of the *Frye* test provides a method by which courts can assess the validity of novel scientific information and safeguards the jury against possibly specious expert testimony. *United States v. Downing*, 753 F.2d 1224, 1235 (3d Cir. 1985).

This Court has not, however, looked to the common law prior to the enactment of the Federal Rules to find their meaning. Instead, this Court has employed the plain-meaning standard in its construction of the Rules. This standard "requires courts to enforce a statute's literal language unless the legislative history intended another meaning." Randolph N. Jonakait, *The Supreme Court, Plain Meaning, and the Changed Rules of Evidence*, 68 Tex. L. Rev. 745, 746 (1990). In several recent cases this Court has adhered strictly to a plain-meaning approach to interpreting the Rules. *See Bourjaily v. United States*, 483 U.S. 171, 179-81 (1987); *Huddleston v. United States*, 485 U.S. 681, 687 (1988). *But see Green v. Bock Laundry Machine Co.*, 490 U.S. 504, 527 (1989) (Scalia, J., concurring) (the Court will go beyond the plain meaning when "a statute which, if interpreted literally, produces an absurd and perhaps unconstitutional result").

A plain-meaning interpretation of the language of Rule 702 and its statutory history means that the *Frye* test is not incorporated in the Rules. Neither the *Frye* test nor the concept of "general acceptance" appear in the text of Article VII. The evidentiary concerns subsumed in the *Frye* test and enumerated by many courts and commentators may be important factors to be considered in establishing a sound evidentiary system; however, they are not part of the language of the Rules and their statutory history.

II. WHAT IS THE PROPER STANDARD OF ADMISSIBILITY OF SCIENTIFIC EVIDENCE UNDER THE FEDERAL RULES?[5]

Although the standard for scientific evidence under Article VII of the Federal Rules is often described as a

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[5] Although this is a civil case, we take note of the fact that whatever interpretation of Article VII this Court chooses will also apply to criminal cases. Rule 702 does not distinguish between civil and

"relevancy test," such a limited characterization constitutes a mere redundancy. Rule 401 already requires, as a threshold matter, that all evidence be relevant to be admitted. Rule 702 focuses the relevancy requirement on the scientific merit [6] of the evidence and expressly mandates that the scientific information "assist the trier of fact." [7] In general, under the Rules all relevant evidence is admitted and the opponent of the evidence bears the burden to provide a good reason to exclude it. In some instances, however, as with hearsay, more is needed to

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criminal cases and, we believe, the threshold admissibility standard should be essentially the same in both contexts. This is not to say, however, that the same evidence might not, ultimately, be treated differently in the two contexts: the danger of unfair prejudice might be much greater in the criminal context from a particular scientific method and thus lead to a different result under Rule 403. *See infra* § II(D). In addition, the present action does not implicate constitutional concerns as might arise in the criminal context when a defendant offers scientific information in his or her defense. *See generally Chambers v. Mississippi*, 410 U.S. 284 (1973).

[6] The discussion herein applies to *all* expert testimony premised upon purportedly scientific methods. Some state courts draw a distinction between expert testimony and scientific evidence, *see e.g., People v. McDonald*, 690 P.2d 709, 723-24 (Cal. 1984) and others draw a distinction between social science and natural science. *See e.g., People v. Stoll*, 783 P.2d 698, 712-13 (Cal. 1989). Such distinctions are unsound as a matter of logic and practice. *See* David L. Faigman, *To Have and Have Not: Assessing the Value of Social Science to the Law as Science and Policy*, 38 Emory L.J. 1005, 1024-25 (1989). Moreover, neither *Frye*, as interpreted by most federal courts, nor the plain language of Article VII of the Rules, draw these distinctions.

[7] Of course, Rule 702 is not limited to the scientific context, for it also applies to "technical or other specialized knowledge." The present discussion is limited to the scientific context because that is the nature of the expertise offered here. Nonscientific expertise presents many similar problems, as well as many special ones, that space does not allow us to consider. *See generally* Charles T. McCormick, *McCormick on Evidence* § 13, at 33-34 (Edward W. Cleary *et al.* eds., 3d ed. 1984).

admit the evidence.[8] As the lower courts have demonstrated, multiple ways exist to interpret what more is needed under Article VII. The remainder of this Brief considers these alternatives and the consequences that follow from each.

A. Does Rule 702 Require Merely That the Witness Be "Qualified"?

Many observers of Rule 702's "relevancy test" have concluded that judges applying the Rule do little more than check the qualifications of the experts. *See, e.g.*, Paul C. Gianelli, *The Admissibility of Novel Scientific Evidence:* Frye v. United States, *A Half-Century Later*, 80 Colum. L. Rev. 1197, 1210 (1980). Commentators have noted that Article VII plainly demands more. *See* Edward J. Imwinkelried, *The "Bases" for Expert Testimony: The Syllogistic Structure of Scientific Testimony*, 67 N.C. L. Rev. 1, 14 (1988). Merely checking qualifications confuses expertise with experts. Having earned the appropriate degrees from a particular discipline does not ensure that the "expert" will provide any assistance to the trier of fact. *United States v. Tranowski*, 659 F.2d 750, 755 (7th Cir. 1981). In effect, judges who only check qualifications defer to the professional guilds to decide what scientific evidence to admit. *See* Comment, *The Psychologist as Expert Witness*, 38 Md. L. Rev. 539, 563-64 (1979). Admissibility of scientific evidence thus

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[8] The Petitioner's second Question Presented raises the issue of the power of lower federal courts under Rule 402's mandate that all relevant evidence is admissible unless excluded pursuant to another rule. We do not disagree with the proposition that Rule 402 was intended to restrict the federal courts' common law making power over the rules of evidence. 22 Charles Allen Wright & Kenneth W. Graham, Jr., *Federal Practice and Procedure: Evidence* § 5192, at 177 (1978). However, regarding the interpretation of Rule 702, the principal question of concern here, Rule 402 provides little guidance. Rule 702, after all, is one of those "other rules" that restrict the admission of "relevant evidence." *See Downing*, 753 F.2d at 1224.

becomes a guild issue resolved not by legal principle, nor on the basis of the accuracy of the information, but instead by the internal politics of professional organizations. *See* David L. Faigman, *To Have and Have Not: Assessing the Value of Social Science to the Law as Science and Policy*, 38 Emory L.J. 1005, 1086 (1989).

To be sure, the qualifications of experts are an explicit and integral component of the threshold inquiry under the Rules. But failure to query more than qualifications at the courthouse door leads inevitably to the admission of invalid science.

B. Do the Federal Rules Contain a "General Acceptance" Standard?

Even if the drafters did not specifically intend to incorporate the *Frye* test into the Federal Rules, the Rules might, nonetheless, contain a general acceptance standard. For instance, Rule 702's requirement that the evidence assist the trier of fact might be construed to require that scientists agree among themselves that the evidence is of assistance before it is presented to the jury.[9]

Severe criticism of the general acceptance test from courts and commentators should serve to caution this Court from interpreting the vague language of Article VII to require the general acceptance test. *See generally Downing*, 753 F.2d at 1235-37. The significant vagueness of the test renders it susceptible to manipulation and tends to obscure the relevant inquiry. *Id.* at 1236. Since the test serves as a proxy for determining the validity[10] of the scientific method, technique or opinion

[9] The general acceptance standard, in principle, applies to the scientific *methodology* used rather than the specific conclusions derived from that methodology. *See Ibn-Tamas v. United States*, 407 A.2d 626, 638 (D.C. App. 1979). The admitting court, of course, still must check that the generally accepted method was *actually* employed to obtain the proffered results.

[10] Courts use the term "reliability" to refer loosely to what scientists separate into validity and reliability. Unfortunately, the use of different terms injects unnecessary confusion into the debate. We use the standard scientific definition of validity so as to create some consistency across the law and science frontiers; this area of the law would be substantially assisted if lawyers and scientists began using the same vocabulary. "Validity" refers to the ability of a scientific test to measure what it purports to measure; "reliability" refers to the ability of a scientific test to obtain consistent results. Paul C. Gianelli, *The Admissibility of Novel Scientific Evidence: Frye v. United States, A Half-Century Later*, 80 Colum. L. Rev. 1197, 1201 n.20 (1980). Consider the example of the polygraph. While a "lie-detector" may be *reliable* in measuring differences in skin conductivity, pulse, respiration and temperature, its *validity* has been challenged on the basis that the relationship between measurable physical changes and lying is uncertain and varies widely among people and circumstances. *See United States v. Williams*, 737 F.2d 594, 611 (7th Cir. 1984). *See generally* Faigman (1989), *supra*, at 1010 n.16. The pertinent question of admissibility is validity. *See* D. Michael Risinger, Mark P. Denbeaux & Michael J. Saks, *Exorcism of Ignorance as a Proxy for Rational Knowledge: The Lessons of Handwriting Identification "Expertise"*, 137 U. Pa. L. Rev. 731, 737 (1989) (In a proficiency test sponsored by the Forensic Sciences Foundation, handwriting experts unanimously agreed on the solution to a handwriting identification problem (100% reliability), but all of them reached an incorrect result (0% validity).).

in question, its utility can best be evaluated on the basis of its success in this capacity.

The general acceptance test suffers from several fundamental weaknesses. It is often criticized as overly conservative, Louisell & Mueller, *supra*, § 105, at 821-22, for it imposes a protracted waiting period that valid scientific evidence and techniques must endure before gaining legal acceptance. *See* Gianelli (1980), *supra*, at 1223; *see also United States v. Addison*, 498 F.2d 741, 743 (D.C. Cir. 1974). Other weaknesses of the general acceptance test concern the problem of ascertaining when a scientific proposition has been generally accepted. There are no standards defining the "pertinent field" to be consulted and nothing in the test to establish what proportion of experts constitute "general acceptance." *See e.g., United States v. Williams*, 583 F.2d 1194, 1198 (2d Cir. 1978), *cert. denied*, 439 U.S. 1117 (1979).

The courts have had considerable difficulty defining the "pertinent field" in which to assess the scientific information because it often extends into more than one academic or professional field. Gianelli (1980), *supra*, at 1208. Compounding this problem is that each field may contain one or more subspecialty. *Id.* at 1209. Although in theory general acceptance is the most conservative test of admissibility, in practice it often results in the most liberal standards of admission. The narrower a court defines the pertinent field, the more agreement it is likely to find. *See Williams*, 583 F.2d at 1198 (noting that "[s]election of the 'relevant scientific community,' appears to influence the result"). Even tea-leaf reading is generally accepted if the pertinent field is practicing tea-leaf readers. The general acceptance test thus degenerates into a process of counting noses. *DeLuca v. Merrell Dow*, 911 F.2d 941, 955 (3d Cir. 1990). Because the pertinent field can be readily manipulated, the test by itself provides little bulwark against shoddy science.

An essential premise of the general acceptance test is that if the scientific community does not agree on the accuracy of scientific information a jury can hardly be expected to resolve the dispute. *Barefoot v. Estelle*, 463 U.S. 880, 929 (1983) (Blackmun, J., dissenting). At the same time, the rule cannot demand consensus, for the nature of the scientific enterprise is dynamic. *See Williams*, 583 F.2d at 1198. While scientists might agree on many propositions, debate, disagreement and constant skepticism are the hallmarks of good science. Therefore, the meaning of general acceptance of scientific methods remains vague: if consensus were the standard, little scientific information would make it through the courthouse door; and if the Rules admit scientific information that is the subject of substantial disagreement, juries are left to answer questions scientists cannot solve."[11]

[11] These criticisms of the general acceptance test do not mean that the views of the "pertinent field" should be ignored. Given the limited time and expertise of judges in evaluating scientific information, they should consider all relevant input regarding the validity of the science. *See infra* § II(C)(3).

C. Does Article VII's Relevancy Test Require the Judge To Conduct a Preliminary Review of the Validity of the Scientific Information?

In addition to the requirement that the expert be qualified, Rule 702 also expressly directs that the expert's testimony "assist the trier of fact." This standard is generally interpreted as creating a "relevancy test." As noted above, in order to avoid redundancy with Rule 401, Rule 702's relevancy test is directed at the probative *scientific* value of the evidence.[12]

Although courts have been reluctant to recognize the relationship between scientific validity and legal relevance, the connection is undeniable. *See* Gianelli & Imwinkelried, *supra*, § 1-6(A), at 32 ("The probative value of scientific evidence depends on its reliability."); Faigman (1989), *supra*, at 1081 ("The *legal relevance* of social science research simply cannot be divorced from its *scientific credibility*."). Indeed, from a scientific standpoint, relevance is synonomous with validity. Notwithstanding their protestations to the contrary, courts regularly evaluate the validity of scientific evidence under Rule 702's relevancy test.

[12] Some courts find implicit in Rule 702 the requirement that the expert testimony must be "beyond the ken of the average layperson" to be admitted. *See McCormick on Evidence*, *supra*, § 206, at 623; *see also United States v. Fosher*, 590 F.2d 381, 383 (1st Cir. 1979); *United States v. Thevis*, 665 F.2d 616, 641 (5th Cir. 1982). In one respect, this view is correct in that ordinarily scientific evidence will be helpful *because* it applies to a subject jurors know nothing about. Courts, however, have consistently interpreted Rule 702's helpfulness test liberally so as to allow experts to testify also to subjects that jurors already know something about. 2 Stephen A. Saltzburg & Michael M. Martin, *Federal Rules of Evidence Manual* 13 (5th ed. 1990) ("[A]n expert can be employed if the expert's testimony will be helpful to the trier of fact in understanding evidence that is simply difficult, [though] not beyond ordinary understanding.").

Suppose a tea-leaf reader, educated and licensed by the appropriate organizations, offers to testify that after reading the plaintiff's tea-leaves he or she concludes that Bendectin caused the plaintiff's birth defects. Obviously, the tea-leaf reader will not be permitted to testify. But why is this obvious? The tea-leaf reader's testimony is "relevant," in that he or she will testify specifically on the issue in dispute. Courts do not permit tea-leaf readers to testify because they do not find this testimony credible; it is not sufficiently "valid." Tea-leaf reading, of course, is an extreme case and it was selected merely to illustrate the point. Still, too much "science" introduced in to American courtrooms is about as valid as tea-leaf reading.[13]

In order to identify the appropriate meaning of "relevance" in Rule 702, it is helpful to consider the meaning of this term as it is understood generally in the law of evidence. The concept of relevance actually contains two components: materiality and probative value. Materiality depends upon the legal issue before the court: "What is 'in issue,' that is, within the range of the litigated controversy, is . . . controlled by the substantive law." Charles T. McCormick, *McCormick on Evidence* § 185, at 541 (Edward W. Cleary *et al.* eds., 3d ed. 1984); *see also* Laurens Walker & John Monahan, *Social Facts: Scientific Methodology as Legal Precedent*, 76 Cal. L. Rev. 877, 883 (1988). The tea-leaf reader's testimony is thus "relevant" because it is "material" to a fact in issue. The second component of "relevance" is "probative value" or "logical relevance." Richard Lempert &

[13] The distinguished physicist Richard Feynman described such "science" as "cargo cult science." According to Professor Feynman, after World War II certain Pacific Islanders wanted the cargo planes to keep returning. These islanders made runways, stationed a man with wooden headphones and bamboo for antennas, lighted some fires and waited for the planes to land. Cargo cult scientists act in the same way. "They follow all the apparent precepts and forms of scientific investigation, but they're missing something essential because the planes don't land." *N.Y. Times*, Feb. 17, 1988 at A1.

Stephen A. Saltzburg, *A Modern Approach to Evidence* 153 (2d ed. 1982) (evidence is relevant if it "tends logically to prove or disprove some fact in issue"). It is this component that relates directly to scientific validity. If scientific information is not valid, it does not increase or decrease the likelihood of any fact in issue.

The matter of relevance is complicated in the Article VII context, however, due to the special methods used by scientists to assess validity. In the following section of this Brief we consider how thorough judges must be in assessing these special methods under the Rules and whether they are up to the task.

1. *Is the validity of scientific information to be decided as a matter of law under Rule 702 and subject to a* de novo *standard of review on appeal?*

The Ninth Circuit below held that the question of the validity of scientific information "is reviewed *de novo* by an appellate court, for '[t]he answer to the question about the reliability of a scientific technique or process does not vary according to the circumstances of each case. It is therefore inappropriate to view this threshold question of reliability as a matter within each trial judge's individual discretion.'" *Daubert*, 951 F.2d at 1130, *quoting Reed v. State*, 391 A.2d 364, 367 (Md. 1978); *see also Williams*, 583 F.2d at 1197-1201.

Although trial courts are invested with wide discretion when applying the Rules, *Hamling v. United States*, 418 U.S. 87, 108 (1974), significant reasons support limiting their discretion regarding validity assessments. First, a substantial component of the "relevance" determination under Rule 702 is legal in character: "The Court has long noted the difficulty of distinguishing between legal and factual issues." *Cooter & Gell v. Hartmarx Corp.*, 496 U.S. 384, 401 (1990); *See* Mark McCormick, *Scientific Evidence: Defining a New Approach to Admissibility*, 67 Iowa L. Rev. 879, 908 (1982) (describing the

question of the admissibility of novel scientific evidence as "a mixed question of law and fact"). Moreover, the factual component of the determination is not the traditional case-specific adjudicative fact to which an appellate court defers to the trial court's findings. *Compare* Kenneth Culp Davis, *An Approach to Problems of Evidence in the Administrative Process*, 55 Harv. L. Rev. 364, 402-03 (1942) (describing and contrasting adjudicative facts and legislative facts) *with* Laurens Walker & John Monahan, *Social Frameworks: A New Use of Social Science in Law*, 73 Va. L. Rev. 559, 563-70 (1987) (modifying and expanding the concept of adjudicative facts). Trial courts are not necessarily better situated to assess the validity of scientific methods. M. McCormick, *supra*, at 909. Such determinations do not, for instance, depend on observing the demeanor of witnesses or knowledge of local conditions.

Scientific methods ordinarily operate at two fact-levels of the trial process. Scientific information both transcends individual disputes and is specific to particular disputes. *See* John Monahan & Laurens Walker, *Social Authority: Obtaining, Evaluating and Establishing Social Science in Law*, 134 U. Pa. L. Rev. 477, 490-91 (1986); *see also* Imwinkelried (1988), *supra*, at 24-25. The *de novo* standard should apply to scientific information that transcends a particular dispute. *See Dunagin v. City of Oxford, Miss.*, 718 F.2d 738, 748-49 n.8 (5th Cir. 1983). Such facts resemble legislative facts much more than adjudicative facts; this Court has historically reviewed legislative facts on a *de novo* standard of review. *See e.g., New York v. Ferber*, 458 U.S. 747, 758 n.9 (1982) (the effect on children of being a subject in pornographic materials); *see generally* David L. Faigman, *"Normative Constitutional Fact-Finding": Exploring the Empirical Component of Constitutional Interpretation*, 139 U. Pa. L. Rev. 541, 552-56 (1991).

An example that illustrates the law-science connection is research on the effects of cigarette smoking on health

in litigation against cigarette producers. A substantial body of research indicates that cigarette smoking significantly increases a person's risk for lung cancer. This research transcends particular disputes and ought to be subjected to *de novo* review; there is no reason to allow different courts to decide this matter differently. *Cf. United States v. Jacobetz*, 955 F.2d 786, 799 (2d Cir. 1992) (taking judicial notice of the general acceptance of the theory underlying DNA profiling and the general techniques used to identify profiles). In addition, the plaintiff will probably offer an expert to testify that the *plaintiff's* lung cancer was caused by cigarette smoking.[14] This testimony has two components. *See* Walker & Monahan (1987), *supra*, at 584; *see also* Robert P. Mosteller, *Legal Doctrines Governing the Admissibility of Expert Testimony Concerning Social Framework Evidence*, 52 Law & Contemp. Probs. 85 (1989). First, it is premised upon the transcendent scientific conclusion that experts can accurately draw such inferences. This scientific premise also should be subject to a *de novo* standard of review. Second, it is premised upon the conclusion that the particular witness is competent to make such a judgment; this assessment is case specific and should be overturned only if the trial judge abused his or her discretion in admitting it. *See Jacobetz*, 955 F.2d at 799 (leaving the reliability of the specific DNA profile used in the case for the jury to determine).

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[14] Not all scientific information is described at the case-specific level at trial. For example, experts who testify on the unreliability of eyewitness identifications present only general research findings indicating the factors related to errors in witnesses' perceptions. The jury is left to draw inferences from the expert's testimony to the case before it. *See e.g., Arizona v. Chapple*, 660 P.2d 1208, 1219 (Ariz. 1983) (concluding that the fact that the expert "would testify to general factors which were applicable to this case . . . , but would not express any opinion with regard to the accuracy of the specific identification," favored admissibility); *see generally* John Monahan & Laurens Walker, *Social Science in Law: Cases and Materials* 346-448 (1990).

Application of less than a *de novo* standard of review to scientific information that transcends individual cases invariably leads to inconsistent treatment of similarly situated claims. The validity of scientific knowledge does not change from court to court; assessments of that knowledge also should not change from court to court.

If scientific knowledge that transcends particular disputes is reviewed under Rule 702 as a matter of law, trial courts must follow established precedent on the issue; if it is a matter of first impression, of course, the trial court must exercise its independent legal judgment. If this Court, however, determines that the validity assessment should be treated more conventionally as a preliminary fact question within the discretion of the trial court, Rule 104 guides the lower court's assessment. We now turn to the question of the nature of that assessment.

2. *Should courts assess the validity of scientific evidence under the 104(a) or under the 104(b) threshold standard of review?*

Judges regularly make factual judgments when applying the Rules. Rule 104 sets forth the two basic types of judgments that judges are called upon to make when evaluating the admissibility of evidence. Rule 104(a) provides that when a fact is a prerequisite to the application of a Rule, the judge must independently find the existence of that fact. *McCormick on Evidence*, *supra*, at 135-37. Judges must find "preliminary facts" under Rule 104(a) by a preponderance of the evidence. *Bourjaily v. United States*, 483 U.S. 171 (1987). Alternatively, when the relevance of testimony depends on the existence of a fact or facts, under 104(b) the judge's threshold examination is limited to finding that a reasonable trier of fact could find the fact to be true. *Huddleston v. United States*, 485 U.S. 681 (1988). This part considers which section of Rule 104 applies to the validity determination to be made under the Rule 702 relevancy test.

McCormick's excellent discussion of the distinctions in application between Rules 104(a) and (b) points out that under 104(a) "the trial judge decides with finality those preliminary questions of fact upon which depends the admissibility of an item of evidence that is objected to under an exclusionary rule of evidence." *McCormick on Evidence*, *supra*, at 135 (footnote omitted). Thus, for example, Rule 104(a) requires judges to independently find under Rule 804(b)(2) that a dying declaration was made under a belief of impending death before permitting the jury to consider the hearsay statement. Rule 104(b), in contrast, applies in those situations "in which the relevancy, i.e. probative value, of a fact offered in evidence depends on the existence of another, and preliminary, fact." *Id.* at 137.

Two recent decisions of this Court adhere to and exemplify the distinct provisions of Rule 104. In *Bourjaily v. United States*, this Court applied the 104(a) standard to the preliminary question whether a conspiracy existed under the hearsay exclusion for the statements of coconspirators. 483 U.S. at 171 (applying Rule 104(a) to *Fed. R. Evid.* 801(d)(2)(E)). Consistent with the traditional standard for preliminary fact review for exclusionary rules of evidence, *Bourjaily* required judges to independently find the existence of a conspiracy by a preponderance of the evidence. In *Huddleston v. United States*, however, this Court did not apply the 104(a) standard to extrinsic act evidence under 404(b). This Court found that Congress' principal concern in enacting Rule 404(b) was not exclusion, but rather "ensuring that restrictions would not be placed on the admission of such evidence." 485 U.S. at 689. Thus, this Court read 404(b) as a rule of inclusion and applied Rule 104(b). *Id.* at 687 ("Generally, . . . Rules [404 through 412] do not flatly prohibit introduction of such evidence but instead limit the purpose for which it may be introduced.").

The determinative issue, therefore, concerns whether to characterize Rule 702 as an "exclusionary rule" to which

104(a) applies or as an "inclusionary rule" to which 104(b) applies.[15] Several factors need to be considered in determining the evidentiary character of Rule 702, including its statutory history, the structure of the Federal Rules and the purposes underlying the Rule's enactment.

The statutory history of Rule 702 is ambiguous regarding its inclusive or exclusive character. As most commentators agree, Article VII was, in part, a reaction to the perceived conservative standard of *Frye*. *See* Paul C. Gianelli, *General Acceptance of Scientific Tests*—Frye *and Beyond, in Scientific and Expert Evidence* 11, 20-30 (Edward J. Imwinkelried ed., 2d ed. 1981). Moreover, the general tenor of the Federal Rules favors admissibility of relevant evidence. *See e.g., Fed. R. Evid.* 402. At the same time, the drafters of Article VII explicitly stated that the Rules should not be so liberally construed that they "break down the rules of exclusion unduly." *Fed. R. Evid. 703 Advisory Committee's Note*; *see also Fed. R. Evid. 706 Advisory Committee's Note* ("The practice of shopping for experts, the venality of some experts, and the reluctance of many reputable experts to involve themselves in litigation, have been matters of deep concern."). Article VII, therefore, was intended to liberalize the admissibility standard of *Frye* but not open the floodgates to all experts dressed in the guise of science.

The structure and principles underlying the Rules generally support application of 104(a) to admissibility questions under 702. Although the Rules support a liberal admissibility standard as reflected in Article IV, the subsequent Articles substantially limit this principle. In

[15] Many scholars have interpreted the proposed revision to Rule 702, discussed *infra*, to create just such a requirement. *See* Ronald L. Carlson, *Experts as Hearsay Conduits: Confrontation Abuses in Opinion Testimony*, 76 Minn. L. Rev. 859, 871-72 (1992); David L. Faigman, *Struggling to Stop the Flood of Unreliable Expert Testimony*, 76 Minn. L. Rev. 877, 885-86 n.41 (1992).

particular, Articles VI, VII and VIII designate whole areas in which otherwise relevant evidence is excluded. Judges are charged with the responsibility for applying these exclusionary rules for good reasons. Jurors are not presumed to be capable of doing the mental gymnastics necessary to assess both admissibiilty and weight; jurors who determine that evidence is not admissible are thought, nonetheless, to put some weight on what they have heard. *See* John Kaplan, *Of Mabrus and Zorgs*, 66 Cal. L. Rev. 987, 997-99 (1978) (criticizing the California Rule for giving these sorts of fact questions to jurors and praising the Federal Rules for treating them as preliminary facts to be decided by judges). Thus, the more stringent 104(a) standard ordinarily applies to the application of exclusionary rules under circumstances when the jury cannot be expected to make both the preliminary and ultimate findings of fact. Rule 702 presents such an instance. Jurors obligated to conduct the initial validity assessment are unlikely to be able to ignore the dubious message of invalid science. Indeed, "novel scientific evidence carries with it concerns over trustworthiness and reliability akin to those raised by offers of hearsay evidence." *Downing*, 753 F.2d at 1240 n.21; *see generally* Peter Tillers & David Schum, *Hearsay Logic*, 76 Minn. L. Rev. 813 (1992). Moreover, many have voiced the concern that jurors will be overwhelmed by the aura of infallibility of scientific evidence, *Barefoot*, 463 U.S. at 926 (Blackmun, J., dissenting); and thus jurors cannot be expected to conduct such a preliminary assessment very well. For these reasons, the judge should guard the courthouse door to ensure that only valid science is admitted. *See Tranowski*, 659 F.2d at 755 (applying Rule 104(a) to assess the validity of the data upon which the expert relied).

Finally, the plainly stated purpose of Rule 702 is to "assist the trier of fact." Implicit in this mandate lies the lesson that judges are to play *some* supervisory role over scientific evidence. In order for this role to have

meaning, judges must independently assess the validity of the scientific evidence. Rule 104(a) provides the strongest judicial check on the vagaries of scientific practice and the best safeguard against jurors being overwhelmed by those practices.

Taking the opposite approach to the validity question would involve the jury under Rule 104(b) in doing something it cannot do well.[16] The latter provision relates to commonsense logic that is the standard of "relevancy" set forth in Rule 401. But the scientific validity standard required by the helpfulness criterion in Rule 702 is not a matter of commonsense judgment. Indeed, the hallmark of science is *not* to trust "commonsense," but rather to test it. Science subjects theories, hypotheses and commonsense to systematic test. This testing distinguishes science from commonsense; and a scientist's claim to expertise depends on his or her adherence to established methods of empirical investigation. *See* Faigman (1989), *supra*, at 1014-21; *cf.* Ronald L. Carlson, *Policing the Bases of Modern Expert Testimony*, 39 Vand. L. Rev. 577, 580 (1986). Under Rule 104(b) the court still must

[16] Professor Edward Imwinkelried, *Judge Versus Jury: Who Should Decide Questions of Preliminary Facts Conditioning the Admissibility of Scientific Evidence?*, 25 Wm. & Mary L. Rev. 577 (1984), concluded that although a 104(a) standard was preferable, the Rules currently mandate only a 104(b) evaluation of scientific validity. Imwinkelried relies on his reading of Rule 901 which, he believes, makes the preliminary finding regarding validity of the scientific process a matter of conditional relevancy. Space does not permit a full response to this unique approach; Judge Becker, however, considered and rejected this view in *Downing*. 753 F.2d at 1240 n.21; *see also McCormick on Evidence* 885 n.6 ("The emphasis of Rule 901 is upon showing that the offered item [e.g., a computer printout] . . . is what it is claimed to be, i.e., that it is genuine . . . rather than that what is in the [computer] is correct."). We join Judge Becker and the Third Circuit in their evaluation of the Imwinkelried view: "We share his view on the need for certain safeguards against unreliable scientific evidence, but dispute the proposition that an amendment to the evidence rules is required to implement them." *Downing*, 753 F.2d at 1241 n.21.

evaluate the foundation supporting the proffered scientific information. It differs from Rule 104(a) only in the level of confidence the judge must have in her determination regarding the validity of the science. Rule 104(b), therefore, does not free the judge from the responsibility for making an independent assessment that a reasonable juror could find the information valid. *See Huddleston*, 485 U.S. at 689-91.

3. *Do judges have the capacity and resources to review the scientific validity of expert testimony?*

Because the Rules require the judge to evaluate the validity of scientific information, the question naturally arises whether judges *can* conduct this inquiry. *See* 3 Weinstein & Berger, *supra*, ¶ 702[03], at 702-34 to 702-35 (recognizing the necessity of assessing "validity" in order to evaluate relevancy, but noting that "the court almost never will have sufficient personal expertise to evaluate the validity of the new development"). Indeed, many courts have expressed discomfort at having to review the methodological and, in particular, statistical underpinnings of scientific research. *See e.g., Craig v. Boren*, 429 U.S. 190, 204 (1976) ("It is unrealistic to expect either members of the judiciary or state officials to be well versed in the rigors of experimental or statistical technique."); *see also State v. Dean*, 307 N.W.2d 628, 646 (Wis. 1981) ("[The] burden on the trial court to assess polygraph evidence may outweigh any probative value the polygraph evidence may have."); *Ethyl Corp. v. EPA*, 541 F.2d 1, 67 (D.C. Cir. 1976) (Bazelon, C.J., concurring) ("[S]ubstantive review of mathematical and scientific evidence by technically illiterate judges is dangerously unreliable. . . .").

Presenting the problem as concern over the ability of judges to comprehend science minutiae, however, misstates the issue. First, even the most difficult concepts used by scientists in the legal forum are no more ab-

struse than the more esoteric concepts judges employ regularly. Monahan & Walker (1986), *supra*, at 511 n.119. Moreover, the reality is that *someone* in the process must evaluate the validity of scientific evidence. Part of a juror's duty to *weigh* scientific evidence includes an assessment of its validity. If jurors can evaluate validity there is little reason to believe judges cannot be as capable in this matter. In fact, there is some reason to believe judges will develop facility with scientific techniques over time. As judges increasingly confront the scientific method, their confidence and sophistication with these methods will grow. *See* Judge Leventhal's response to Judge Bazelon, *supra*, in *Ethyl Corp.*, 541 F.2d at 69 (Leventhal, J., concurring) ("The aim of the judge is not to exercise expertise or decide technical questions, but simply to gain sufficient background orientation. Our obligation is not to be jettisoned because our initial technical understanding may be meagre when compared to our initial grasp of FCC or freedom of speech questions.").

To say that judges must achieve an understanding of science does not mean that they must become experts themselves in the sundry scientific disciplines that come into court today. Instead, judges must familiarize themselves with the generally applicable techniques used to critically examine the validity of a particular theory or method. Several courts and commentators have suggested factors that the sophisticated court could examine in making such an assessment. In *Downing*, the court identified eight considerations relevant to an assessment of scientific accuracy: (1) the degree of acceptance within the scientific community, (2) the novelty of the technique, (3) the existence of specialized literature dealing with the technique, (4) the qualifications and professional stature of the expert witness, (5) the non-judicial uses to which the scientific technique is put, (6) the frequency with which the technique leads to erroneous results, (7) the type of error generated by the technique,

and (8) any expert testimony that has been offered in earlier cases to support or dispute the merits of a particular scientific procedure. 753 F.2d at 1238-39. Similar factors have been suggested by numerous commentators. *See e.g.*, Weinstein & Berger, *supra*, ¶ 702[03], at 702-41 to 702-42 (listing seven factors); M. McCormick, *supra*, at 911-12 (1982) (listing eleven factors); Bert Black, *A Unified Theory of Scientific Evidence*, 56 Fordham L. Rev. 595, 642-43 n.258 (1988) (listing four of the factors proposed by the 1983 National Conference of Lawyers and Scientists); Monahan & Walker (1986), *supra*, at 498-512 (articulating guidelines for evaluating social science authority). Rule 702's relevancy standard requires courts to assess the validity of scientific information; a court should rely on a multitude of factors to assist it in that determination. Although it is beyond the scope of this Brief to state and analyze all of the possible factors that judges could consider in determining validity, it is clear that substantial guidance does exist to assist judges in assessing validity.[17]

A significant issue raised in the petition for *certiorari* concerns what part peer review should play in determining admissibility. We agree that courts should not wholly delegate responsibility to the editors of scientific journals. Peer review suffers too many limitations to be, by itself, a litmus test for the admissibility of scientific information. *See* Charles W. McCutchen, *Peer Review: Treacherous Servant, Disastrous Master*, Tech. Rev. 28 (Oct. 1991). Nonetheless, research subjected to peer review undergoes a level of scrutiny that non-reviewed research

[17] Rule 706 provides judges with a mechanism by which expert witnesses can be appointed to assist them with the intricacies of scientific information. Unfortunately, as a recent study by the Federal Judicial Center indicates, Rule 706 has not proved very helpful to judges. Joe S. Cecil and Thomas E. Willging, *Defining a Role for Court-Appointed Experts*, 4 FJC Directions 6 (1992) (finding, among other things, that only 20% of judges surveyed had ever appointed experts under Rule 706).

does not. *See* Arnold S. Relman & Marcia Angell, *How Good is Peer Review?*, 321 New Eng. J. Med. 827, 828 (1989). Courts must, to the extent practicable, independently evaluate all evidence proffered; evaluating the validity of scientific information will entail consultation of a variety of authorities. Whether research survived peer review should be just one factor among many that courts consider when examining the validity of scientific information.

To be sure, applying a Rule 104(a) threshold evaluation will not eliminate all of the problems inherent in the examination of scientific techniques in the legal setting. It does, however, provide judges with a principled method for recognizing and guarding against shoddy science. As Professors John Monahan and Laurens Walker noted, "[i]t would be foolish to suggest that all social science studies can be adequately evaluated by reference to a simple checklist of threats to validity and a short catalogue of how various research designs neutralize those threats. Even a crude screening device to evaluate the validity of research studies, however, can go far in reducing a court's reliance upon inadequate empirical data." Monahan & Walker (1986), *supra*, at 509.

D. Subsequent to a Preliminary Finding of "Relevance" (*i.e., validity*) Under Rule 702, What Role Does 403 Play Regarding Scientific Information?

Rule 403 provides a final check on the admissibility of scientific evidence. To a large extent, Rule 403 presupposes that the relevance of the scientific information has been assessed by the judge as mandated by Rules 702 and 104. Rule 403, therefore, should not be understood as placing an affirmative obligation on scientific evidence to be valid, nor does it contain an independent standard of admissibility such as requiring "general acceptance." Rule 403 is a negative check on scientific information that, though valid, would cause so much prejudice or waste

so much time that it should be excluded. *See Huddleston*, 485 U.S. at 691 (citing Rule 403 as protection against "unduly prejudicial evidence"); *see generally* Donald N. Bersoff, *Psychologists and the Judicial System: Broader Perspectives*, 10 L. & Hum. Behav. 151, 157 (1986).

Finally, Rule 403 faithfully effectuates a central principle inherent in *Frye's* general acceptance standard. A primary purpose of *Frye* was to keep from the jury novel science that might overwhelm it. *Frye*, however, imperfectly achieved the purpose because the definition of novel scientific evidence does not necessarily correspond with expert evidence likely to excessively persuade the jury. Rule 403, operating in combination with Rule 104(a), accomplishes the job more precisely.

E. Conclusion

The matter of judges becoming effective screeners of scientific information is not merely an academic matter. There are substantial costs associated with judges continuing to fail to impose some principle on the admissibility of scientific information. The costs in court time alone to litigate cases involving shoddy science is staggering. The increasing tendency in the lower courts to adopt more stringent rules is undoubtedly a response to this phenomenon. In addition, there are enormous costs to society when defendants are forced to litigate claims that are premised upon little more than the alignment of tea-leaves. Although far from unambiguous, the Rules contain sufficiently definite principles in Article VII together with Rules 104(a) and 403 by which judges can effectively monitor the admission of scientific information.

III. SHOULD THIS COURT DISMISS THE *WRIT OF CERTIORARI* AS IMPROVIDENTLY GRANTED IN LIGHT OF THE SIGNIFICANT LEGISLATIVE ATTENTION NOW FOCUSED ON RULE 702?

One final issue must be considered regarding this Court's examination of Article VII. In 1991, the Committee on Rules of Practice and Procedure published a proposed amendment to Rule 702.[18] As this Court is likely aware, after receiving substantial public comment, the Committee decided not to recommend adoption of the proposed rule. Instead, the Committee endorsed a request to the Chief Justice that he reactivate an Advisory Committee on the Federal Rules of Evidence to revisit the issue. *See Preliminary Report: Judicial Conference Actions, September 22, 1992, Jud. Conf. of the U.S.* This recommendation has reportedly been accepted.[19]

In light of the substantial legislative attention being cast upon Article VII, the Court should consider whether the *writ of certiorari* was improvidently granted. The

[18] The proposed amendment to Rule 702 provides, in pertinent part, as follows:

> Testimony providing scientific, technical, or other specialized information, in the form of an opinion or otherwise, may be permitted only if (1) the information is reasonably reliable and will substantially assist the trier of fact to understand the evidence or to determine a fact in issue and (2) the witness is qualified as an expert by knowledge, skill, experience, training, or education to provide such testimony . . . .

Preliminary Draft of Proposed Amendments to the Fed. Rules of Civil Procedure and the Fed. Rules of Evidence, 137 F.R.D. 53, 156 (1991). The proposed amendment was designed to strengthen Rule 702 in two principal respects. First, it adds the requirement that the science be "reasonably reliable" and, second, it mandates that the evidence "substantially" assist, not merely "assist," the trier of fact. *See generally* Frederic I. Lederer, *Resolving the Frye Dilemma —A Reliability Approach*, 26 Jurimetrics 240 (1986).

[19] Telephone Interview with John Rabiej, Rules Committee Support Office, Judicial Conference of the United States (Nov. 4, 1992).

complexity of the subject and the ambiguity surrounding the construction of Rule 702 suggest that this might be an inopportune time for the Court to decide the matter. Instead, the Court might prefer to leave the matter to the Committee to study the issue extensively and construct a viable solution.

On balance, however, we do not recommend that the *writ of certiorari* be dismissed. The Committee's work is likely to take a significant amount of time to complete. In the meantime, the lower courts are likely to continue to cut different paths through the Rule 702 thicket. Given the strong interest in uniformity reflected in the passage of the Rules, continuation of the present state of affairs for any significant amount of time is not recommended.

Respectfully submitted,

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